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Report Highlights:

New Zealand administers a rigorous and comprehensive regime for genetically modified organisms (GMOs). While several contained field trials have been approved in New Zealand, there is still no commercial production of GM products and GM technology remains a highly charged political issue with strong opposition from the Green Party and many consumer groups. However, there is evidence that attitudes toward GM technology are beginning to change and there are expectations that research organizations are gearing up to make applications to conditionally release GM crops.

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SECTION I. EXECUTIVE SUMMARY

The New Zealand Government (NZG) maintains one of the most comprehensive and rigorous approval regimes for genetically modified organisms (GMOs) in the world. While the NZG ended the moratorium on GMOs in 2003, there is still no commercial production of genetically modified (GM) crops in New Zealand and GM technology remains a highly charged political issue with strong opposition from the Green Party and many consumer groups. Even some commodity organizations and farmers oppose the use of GM technology out of concern that it will tarnish New Zealand's "clean and green" image and negatively impact on the ability to market products overseas.

Under the Hazardous Substances and New Organisms Act (HSNO) passed in 1996, the Environmental Risk Management Authority (ERMA) has the responsibility for controlling GM in New Zealand. ERMA operates in line with the NZG's cautious approach to GM technology only approving applications if the benefits outweigh the risks. While ERMA has approved several contained trials, to date, no organization has submitted an application for conditional or full-scale commercial production of a GM product. Many attribute this to the onerous, costly and unproven nature of the GM regulatory framework, which includes a lengthy public consultation process. As the first applicant for a GM release will likely come under intensive public scrutiny and pressure from a number of different groups, some New Zealand companies have opted to go through the regulatory approval process in other countries such as Australia.

There are signs that attitudes toward GM technology in New Zealand are beginning to change. The initial field trial application submitted in 2003 by Crop and Food Research (CFR), a crown research institute, to trial GM onions attracted nearly 2,000 submissions. However, the application submitted by CFR in April 2008 to undertake a field evaluation of GM brassicas (broccoli, cabbage, cauliflower and forage kale) modified for resistance to caterpillar pests attracted just 123 submissions. Likewise, an appeal lodged against CFR's brassica trial was recently dismissed and the judge awarded costs to ERMA and CFR. There have also been several press articles touting the need to rethink New Zealand's restrictive stance on GM technology. Some argue that GM technology could help alleviate the types of problems caused by the recent rise in food and fuel prices as well as help address environmental issues. Others express concern that the New Zealand agricultural sector will fall behind competitor countries if it doesn't embrace GM technology.

In spite of its rigorous domestic GM regulatory framework, the NZG plays an important role internationally in securing science-based trade rules for GM products. As a party to the Cartagena Biosafety Protocol, New Zealand has worked to ensure that measures to protect the environment are not unfairly trade disruptive for biotech products.

SECTION II. BIOTECHNOLOGY RESEARCH, PRODUCTION AND TRADE

Overview

GM techniques have been widely used in New Zealand research for more than a decade. However, all use of GM in New Zealand is in contained environments, such as laboratories, and it is predominately used as a tool for research. At present there are no commercially available GM products produced in New Zealand. There are several major issues discouraging commercialization of GM crops in New Zealand. The lack of funding to undertake all of the required agronomy, stewardship and other research, particularly on products that are relevant to New Zealand, is a significant issue as the research would require extensive conditional release research, which is both socially and politically difficult to undertake. In addition, there is significant cost and uncertainty associated with the approval process. For many crops in New Zealand, production is simply not large enough to justify going through the process.

Statistics New Zealand measures the use of biotechnology and the characteristics of biotechnology organizations, including the use of strategic alliances, information sharing and constraints to biotechnology work, through a regular survey. It uses the OECD definition of biotechnology, which is defined as "the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, good and services". According to the 2007 survey:

- in the last two year, 67% of biotechnology techniques used in New Zealand were in the research and development stage;
- 21% of biotechnology organizations are active in the Auckland region;
- New Zealand organizations were granted 225 biotechnology-related patents in the two years to June 30, 2007;
- 30% of biotechnology organizations that recruited overseas obtained staff from the United States; and,
- The most common constraint to biotechnology R&D faced by organizations was access to capital followed by access to qualified biotechnology research and technical experts.

Contained GM Field Trials

Since the HSNO Act was implemented in 1996, New Zealand has had 17 applications for GM outdoor field trials. The most recent was in April 2008, when CFR submitted an application to ERMA to undertake a field evaluation of GM onions, spring onions, garlic and leeks over a ten-year period on approximately 2.5 hectares. In response to this application, ERMA received 123 submissions from community groups, Maori groups, scientists and members of the public. This is a lot less than the 1,933 submissions received regarding CFR's previous GM onion application in 2003. The next step is for the ERMA staff to assemble an evaluation and review (E&R) report on the application. The E&R will summarize the relevant science and the submissions and will be sent to submitters and made available to the general public.

A complete listing of the field trials being conducted in New Zealand can be found in Appendix II.

GM Research

In spite of the rigid regulatory regime, there is a fairly significant amount of contained GM research in New Zealand. Much of the research is being conducted by crown research institutes (CRIs), which are funded both by the NZG and the private sector.

In New Zealand, CFR has been one of the pioneers of GM field trials with research dating back 20 years. CFR's research includes the development of crops, such as potatoes and onions, that are disease-resistant, have extended shelf-life, and have advanced agronomic traits. One area of research, conducted in collaboration with Japan, that holds potential is the GM "tearless" onion, which, when peeled, does not cause human eyes to water.

AgResearch, another CRI, is about to lodge an application with ERMA to allow it to continue and expand its contained field trial research on transgeneic animals. AgResearch has bred transgenic cattle with additional copies of casein genes to create milk with higher levels of casein. Another project has involved developing transgenic cattle so that they produce a milk protein that will be tested as a potential treatment for multiple sclerosis. AgResearch is also developing new hormones, vaccines and diagnostic products for sheep using GM techniques.

Scion, formerly known as Forest Research, is another CRI that conducts forestry and biomaterials research. Scion has received two approvals from ERMA to conduct contained field trials on trees. At one of the sites, the research is focusing on genetically modifying genes that control reproductive development. Scion has reportedly been able to produce sterile trees that do not produce pollen, which could spread modified genes to non-GM trees. At its research facility in Rotorua, Scion has been carrying out a field trial planting of GM Radiata pine and Norway spruce trees. The GM trees contain reporter genes, herbicide resistant genes and genes that are thought to affect floral developments. Several groups in New Zealand, including the Soil and Health Association, a New Zealand NGO founded in 1941, have been campaigning for the GM tree trial to be stopped. In January 2008, someone got into Scion's GM tree experiment site by digging under the fence and damaged 19 trees. This was the first attack of its kind at the property. Scion, like other CRIs, has several international partners including Verenum Corporation, a U.S. biofuels company, and ArborGen LLC, a U.S. firm specializing in tree genetics.

HortResearch, the CRI focused on fruit research, does not have any active GM contained field trials and is not actively pursuing any applications with ERMA but is conducting research into fruit genomics. Research currently underway seeks to identify the genes and proteins involved in responding to pests and diseases, genes that control plant development (flower and fruit quality) and the genes involved in how a plant responds to stresses in the environment. However, marketing research indicates that consumers in key overseas markets are not receptive to GM fruits. The New Zealand industry is reluctant to be seen as supporting the development of GM products due to the concern that it could negatively impact on their ability to market products overseas.

One of the areas in which progress is being made in New Zealand is cisgenics – modification that uses only the genes from the species itself. In the field of forage plant research, there are no contained GM field trials in New Zealand at the moment. However, given the importance of agriculture, and the meat and dairy sectors in particular, to the New Zealand economy, there is considerable work on pastoral genomics. The Pastoral Genomics Research Consortium, a joint-venture consisting of Meat and Wool New Zealand, Dairy New Zealand, DEEResearch (the dairy, sheep, beef, and deer farmers levy funded research, trade, and extension organizations); Fonterra (NZ's largest dairy cooperative), and AgResearch are researching a cisgenics approach to develop a perennial ryegrass with significant improvements to drought resistance and plant biomass. The consortium is also researching nitrogen and water use efficiency traits in ryegrass as well as general productivity and agronomic traits in white clover and the role of condensed tannins in animal nutrition. The research program makes use of molecular marker discovery technology developed by a U.S.

biotechnology company. The consortium has links with the Noble Foundation in Oklahoma and the University of Florida.

SECTION III. BIOTECHNOLOGY POLICY AND REGULATORY FRAMEWORK

General Policy on Genetic Modification

All GMOs are prohibited from entry into New Zealand unless they have been formally approved by ERMA. To date, ERMA has granted only contained use approvals for GMOs under the HSNO Act but has not approved any GMOs for conditional or full-scale release. In essence, the NZG's policy on GM is that New Zealand should proceed with caution while at the same time ensure that opportunities are preserved. This is in line with the overall conclusion of the Royal Commission Report on Genetic Modification, which was published in 2002. The report stated that "it would be unwise to turn our back on the potential advantages on offer, but we should proceed carefully, minimizing and managing risks". Essentially, the report concluded that New Zealand should keep its options open.

The Main Laws Governing Genetic Modification

- Hazardous Substances and New Organisms (HSNO) Act 1996
- Hazardous Substances and New Organisms (Methodology) Order 1998
- Hazardous Substances and New Organisms (Low-risk Genetic Modification) Regulations 2003
- Imports and Exports Restrictions Act 1988
- Import and Exports (Living Modified Organisms) Prohibition Regulations 2005
- Customs and Excise Act 1996
- Bio-security Act 1993 (including Ministry of Agriculture and Forestry (MAF)/Environmental Risk Management Authority (ERMA) Containment Standards; MAF Import Health Standards)
- Agricultural Compounds and Veterinary Medicines Act 1997
- Medicines Act 1981
- Food Standards Australia New Zealand Act 1991
- Official Information Act 1982

The Hazardous Substances and New Organisms (HSNO) Act 1996 regulates research into and release of all living things that do not already exist in New Zealand, including those that are genetically modified. The HSNO Act is administered by the Ministry for the Environment (MEF) but implemented by ERMA, which was established as an independent body under the Act.

The HSNO Act applies to anything that can potentially grow, reproduce and be reproduced, whether or not it is also a food or a medicine. Before any new organism, including a GMO, can be imported, developed, field tested or released into the environment, the applicant must get the approval from ERMA.

The [HSNO Act was amended](#) to provide for more flexibility in the regulation of GMOs. As amended, the HSNO Act allows for a new category of release called "conditional release". This allows ERMA to place controls on the use of GMOs approved for conditional release – for example special security fencing for animals, or requiring that a GM plant flowers at a different time from conventional crops of the same species. To date, there has not been an application for a conditional release of a GMO but on-going research in New Zealand suggests that there are several products in the pipeline.

Key Government Agencies Responsible for Administering and Enforcing GM Policy

Ministry for the Environment (www.mfe.govt.nz): MEF advises the NZG on environmental laws and policies, including managing the risks of introducing new organisms. It is responsible for the management and maintenance of the HSNO Act.

Environmental Risk Management Authority (www.ermanz.govt.nz): ERMA is responsible for assessing and deciding on applications to introduce new organisms, including GMOs, into New Zealand, and for their development and domestic use. It is an independent, quasi-judicial decision-making agency established under the HSNO Act to make decisions on the import and domestic use of all GMOs, as well as other new organisms and hazardous substances.

Food Standards Australia New Zealand (www.foodstandards.gov.au): FSANZ is a bi-national independent statutory authority operating under the Food Standards Australia New Zealand Act 1991. It is responsible for developing food standards for both Australia and New Zealand, emphasizing the protection of public health and safety. The standards cover composition, labeling and contaminants, including microbiological limits. They apply to all food produced or imported for sale in Australia and New Zealand, including food products that are or contain GMOs. The final approving body for standards developed by Food Standards Australia New Zealand is the Australia New Zealand Food Standards Council (ANZFS), which is made up of the Australian Commonwealth, state and territory Ministers of Health and the New Zealand Minister of Health.

Ministry of Agriculture and Forestry (www.maf.govt.nz): MAF is responsible for enforcing the conditions for genetically modified organisms imposed by ERMA on approved field tests and conditionally released organisms. This work also involves the inspection of containment facilities for research in containment and ensuring importers comply with the HSNO Act.

New Zealand Food Safety Authority (www.nzfsa.govt.nz): NZFSA is responsible for administering standards for safety, labeling and composition of food sold in New Zealand, including imported food and foods produced using genetic modification.

Ministry of Research, Science, and Technology (www.morst.govt.nz): MORST is charged with developing New Zealand's research and innovation policies as they relate to biotechnology. Although it establishes research allocation guidelines and policies, it contracts other agencies to handle the allocation process. The main distributor of Government funding in New Zealand is the Foundation for Research, Science and Technology¹ (FRST). FRST is a Crown entity charged with investing in innovation and fostering the creation of new knowledge.

The Approval Process for GMOs

All decisions on the importation and domestic use of living modified organisms that are genetically modified are made by ERMA on the basis of a thorough assessment of the potential risks and benefits posed by the organisms, under the stringent requirements of the HSNO Act 1996. If approval is given for development in containment, or for importation into containment, further approval must be given before the organisms can be field tested,

conditionally released or fully released. Approval is only given if, in the opinion of ERMA, the benefits of the GMO outweigh the risks.

Under the HSNO Act, ERMA must evaluate the potential risks of new organisms according to strict minimum standards designed to protect the environment, and the health and safety of people and communities. The HSNO Act requires that the following matters be taken into account by decision makers:

- the sustainability of all native and valued introduced flora and fauna;
- the intrinsic value of ecosystems;
- public health;
- the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu (sacred places), valued flora and fauna, and other taonga (sacred or treasured things);
- the economic and related benefits and costs of using a particular new organism; and
- New Zealand's international obligations.

When considering a new organism for conditional or full release, ERMA must first decide whether or not the organism would be likely to have any significant effect on the environment or human health and safety. ERMA then looks at any potential economic and other benefits and weighs these up against the risks. The cost/benefit analysis provides a basis for the final decision on whether or not any organisms should be released. Under a conditional release, ERMA stipulates certain conditions such as restrictions on where GM crops can be grown, compulsory buffer zones between the GM crop and conventional crops, regulations on planting time, or controls on how the crop is harvested and processed. In the case of GM animals, conditions could include high security fencing and requirements for disposing of waste. Under a conditional release scenario, MAF is responsible for enforcing compliance. ERMA can grant a full release if there are no potential risks that need to be managed by the imposition of conditions. ERMA's decision to approve or decline an application can be appealed by the High Court. If the application goes ahead, conditions are monitored and enforced by MAF.

Consultation with the public is an integral component in the case-by-case decision-making process. The HSNO Act requires ERMA to publicly notify applications where it considers there is likely to be significant public interest in the application. The public notice provides a means by which any person may make a written submission in the application. A public hearing of an application may also be held if one is requested by the applicant, by a person who has made a submission, or if ERMA considers that a hearing is necessary to ensure due consideration of all the relevant matters.

The Royal Commission report recognized the significance of the cultural, ethical and spiritual aspects of biotechnology in general. The report suggested that a Bioethics Council be established to provide advice and promote ongoing dialogue among New Zealanders on the issues. The NZG agreed with this approach and the Council was established in December 2003. The role of the Council is to promote public dialogue on issues in current and future biotechnology research and development that have significant cultural, ethical and spiritual dimensions. It is to use the results of that dialogue as a basis for its advice to Government. Government departments draw on the Bioethics Council's advice in developing policies on biotechnology. For instance, ERMA can take the Councils' advice into account when making its decisions. In line with recommendations from the Royal Commission, the HSNO Act was amended to give greater recognition to the knowledge and experience of Maori values by those involved in the decision making process on new organisms, including GMOs. When applications for the release of GMOs in New Zealand are considered by ERMA, the HSNO Act requires ERMA to take into account the relationship Maori and their culture and traditions have with their ancestral lands, water, sites, flora and fauna. This means that ERMA must

assess the potential impact of the organisms on indigenous plants and animals – as well as introduced ones – that are valued by the Maori.

GM Food Regulations

New Zealand's regulations governing GM foods are among the world's most stringent. GM foods and ingredients can only be sold in New Zealand if they have been assessed for safety by FSANZ and approved by the Australia New Zealand Food Standards Council (ANZFS), a council of Australian and New Zealand Health Ministers. Although FSANZ has approved 34 GM processed products for sale in New Zealand, supermarkets have a stated policy not to offer GM products for sale.

As of 2001, all genetically modified foods sold in New Zealand must be labeled. This means that any food, food ingredient, food additive, food processing aid or flavoring that contains genetically modified DNA or protein must have this fact noted on the label. If a food or ingredient has altered characteristics, this must also be on the label. For example, if oil was made from a plant that had been genetically modified so that its oil boils at a higher temperature, the oil would have to be labeled, even though no genetically modified material would be present. A genetically modified ingredient does not have to be listed on the label when:

- It is a flavoring in the food and makes up less than 0.1% of that food; or
- An ingredient unintentionally contains genetically modified material at levels of less than 1% of that ingredient.

Meat and other products from animals that have been fed GM food do not need to be labeled as genetically modified. Also, there are no labeling requirements for foods prepared in restaurants, as takeaways or at supermarkets.

Standard A18/1.5.2 of the Australia New Zealand Food Standards Code outlines the legal requirements for the sale and labeling of GM food. Negative content labeling such as "GM Free" is not addressed as part of the labeling standard.

Meeting the requirements of New Zealand's GM food labeling regulations places a burden on manufacturers, packers, importers, and retailers to take reasonable steps to determine if the food is genetically modified or has a GM ingredient and to ascertain if the GM food is approved. The importer usually has the primary responsibility for ensuring the accuracy of the label and compliance with New Zealand's GM food labeling requirements. Wholesalers and retailers usually demand GM-free declarations from their supplier/importer, which passes liability in the event of GM labeling non-compliance back to the importer. New Zealand food legislation requires businesses to exercise due diligence in complying with food standards. Meeting those obligations is usually interpreted to require a paper or audit trail similar to a quality assurance system.

NZFSA does not inspect individual food import shipments for compliance with GM food labeling requirements. Periodic compliance audits conducted by NZFSA usually start by selecting a number of items from retail shelves and working back to the local manufacturer or the importer of record. For imported food, this largely consists of a review of importer compliance with their responsibility to adequately document the GM content of their food imports based upon information obtained from overseas exporters/manufacturers and that food product labels indicate GM content if necessary.

GM Animal Feed Regulations

Regulatory approval is not required to feed GM feed to animals. This is covered by the Agricultural Compounds and Veterinary Medicines (ACVM) regulations 2001, which are issued under the ACVM Act (1997). The ACVM regulations state that materials fed to animals should be safe and not cause harm to the animal. A distinction between GM and non-GM feed is not defined. When imported, animal feed gains entry to New Zealand under its general import health standards, with no distinction made between GM and non-GM animal feed.

The current approach taken by FSANZ recognizes that many animal feeds are derived from the same GM commodities (e.g. corn) that are used for human consumption, and, as a result, it is difficult to keep the food and feed chains completely separate. FSANZ's policy is to avoid "split use" approvals, where a GM plant receives approval for use as animal feed but not for human food. This approach, which is also practiced in the United States and Canada, arose following an incident in the United States where traces of a GM corn (known as StarLink™ corn), which had been approved for animal feed only, were found in human food products. The incident caused consumer concern and disruption to trade and highlighted that adventitious contamination can occur despite well developed identity preservation and segregation systems being in place. To prevent similar incidents occurring in the future it is now common practice for GM plants intended primarily for feed use to also undergo food safety assessment and approval for human food use. This policy is intended to minimize the risk of unassessed and unapproved products entering the food supply as a result of inadvertent co-mingling of grain/seeds during transport and storage, and also ensures that their use as feed will not pose indirect risks to humans. Examples of GM crops that have been developed primarily for animal feed but which have also been granted approval as human foods in Australia and New Zealand include high lysine corn, and herbicide-tolerant lucerne.

Certification on Non-GM Planting Seeds

New Zealand requires that all imports of non-GM planting seeds, which have commercially grown GM varieties available, be tested and certified as free of any GM seeds. This includes corn (maize), canola (rapeseed) and soybean seeds. New Zealand has a zero tolerance policy in regard to the presence of GM varieties - if any GM seed is detected, regardless of the level of contamination, that shipment will be rejected.

The most recent example of the detection of GM seed in a shipment certified as containing conventional seed only was in December 2006 (see NZ6022 and NZ 6025 for further information). MAF reported that 3.22 of the 4.42 tons of sweet corn seeds in the shipment were confirmed as having some GM seed present. The seeds with GM presence and any resulting crops were destroyed. The remainder of the seeds were tested three times for the presence of GM seeds with negative results, before permission was given to harvest the resulting crop.

Cartagena (Biosafety) Protocol

The Cartagena Protocol on Biosafety entered into force for New Zealand on May 2005, following New Zealand's ratification of the agreement in February 2005. The protocol regulates the trade of living modified organisms. New Zealand was already assessing genetically modified organisms before importation into New Zealand on a case-by-case basis and ratified the protocol to be a 'good international citizen'. Several industries, however, such as the dairy sector, are concerned that the EU or other countries might use the "precautionary principle" to restrict trade.

New Zealand is one of the few major agricultural exporters that are a signatory to the Cartagena Protocol. The NZG tends to have a similar stance on issues in the Protocol as the United States. Both countries are concerned about liability and redress, handling, transport, packaging and identification issues relative to living modified organisms (LMOs) as well as potential conflicts with other international obligations. As a result, New Zealand has become an ally of the United States at Biosafety Protocol meetings and plays a critical role in helping to shape more balanced decisions at Protocol meetings.

SECTION IV. MARKETING ISSUES

Biotechnology continues to be a politically sensitive subject in New Zealand that evokes strong opposition from the Green Party as well as a small number of NGO organizations often with influence out of proportion to numerical support. These groups seek to prevent commercial releases of genetically modified organisms into the environment as well as to impose restrictions against consumption of foods with GM content.

New Zealand consumers are usually cautious when purchasing GM foods and have tended to avoid such foods but such attitudes may be weakening. Some research conducted in New Zealand has found that New Zealand consumers will still purchase foods when they are aware that it contains GM product. For example, a research paper published in *Nature Biotechnology* in May 2007² found that a large number of consumers in New Zealand were willing to purchase a GM variety of fruit over conventional or organic fruit, if there was a price advantage and consumer benefit (in this instance it was 'spray free').

Many New Zealand farmers support the commercialization of appropriate GM varieties of crops in New Zealand and have expressed concern that, by not embracing GM technology, they are falling behind their competitors. They are, however, cautious in their approach. Before making planting decisions, most would want assurances that there would be marketing opportunities for GM crops. Some agricultural industry associations in New Zealand oppose the adoption of GM crops because of the concern that it will tarnish New Zealand's clean and green image and negatively impact on their ability to market products abroad.

SECTION V. OUTREACH ACTIVITIES

In the past, outreach programs organized by FAS in New Zealand have mainly involved the use of recognized U.S. speakers promoting the risks and benefits of biotechnology to New Zealand. The most recent was the Embassy supported visit of Martina Newell-McGloughlin of the University of California, Davis. She was a guest speaker at a seminar for journalists jointly organized by Federated Farmers and AgResearch. Dr. Newell-McGloughlin also gave a presentation to the general public in Wellington.

² Knight, J.G., Mather, D.W., Holdsworth, D.K., & Ermen, D.F. (2007). Acceptance of GM food – an experiment in six countries. *Nature Biotechnology*, 25(5), 507-508.

APPENDIX I. REFERENCE MATERIAL

The Environmental Risk Management Authority – regulator under the HSNO Act
www.ermanz.govt.nz

The Ministry for the Environment – administers the HSNO Act
www.mfe.govt.nz

Food Standards Australia New Zealand – developed the safety and labeling standards, and undertakes any safety assessments, for GM foods
www.foodstandards.govt.nz (Click on “Food standards Code” then section 1.5.2)

New Zealand Food Safety Authority – responsible for food safety and suitability standards/implementation/compliance/enforcement in New Zealand
www.nzfsa.govt.nz

Biosecurity New Zealand – part of the Ministry of Agriculture and Forestry responsible for imports into New Zealand
www.biosecurity.govt.nz

Ministry of Research, Science and Technology – implements the Government’s research strategy and regulations
<http://www.morst.govt.nz/current-work/biotechnology/>

Foundation of Research, Science and Technology – contracted by MoRST to allocate the majority of Government funding for research
www.frst.govt.nz

Searchable database listing research projects that FRST has contributed funding to
<http://www.frst.govt.nz/database/reports06/index.cfm>

NZbio – an incorporated society tasked with assisting the growth of New Zealand’s biotech sector
www.nzbio.org.nz

New Zealand Trade and Enterprise – assists and promotes New Zealand businesses
www.nzte.govt.nz

Biotechnology learning hub
<http://www.biotechlearn.org.nz/>

New Zealand’s Bioethics Council
<http://www.bioethics.org.nz/>

A list of New Zealand’s Crown Research Institutes
<http://www.ccm.au.govt.nz/crown-research-institutes.html>

New Zealand’s Biotechnology Strategy
<http://www.morst.govt.nz/publications/a-z/n/nz-biotechnology-strategy/>

Full Text of the Hazardous Substances and New Organisms Act (1996)
<http://www.legislation.govt.nz/>
(Select under ‘Statutes’)

APPENDIX II. GM FIELD TRIAL APPLICATIONS.

The table below lists the applications to field test a GM organism lodged with ERMA under the HSNO act since 1998. For more information on these applications, go to <http://www.ermanz.govt.nz/search/registers.html>.

Code	Applicant	Description	Purpose	Status
GMF98009	Ag Research	GM Cattle	To field test, in Waikato, cattle genetically modified with cattle casein genes or the human myelin basic protein gene, or deletion of the cattle lacto globulin gene. Milk may have enhanced nutritive value or be valuable as a drug for multiple sclerosis.	Still active
GMF99001	Scion	GM Pine Trees	To field test, in the Bay of Plenty (Rotorua), over a period of 20 years, Pinus radiata plants with genetic modifications to the genes controlling reproductive development. The total duration of this project including a post-trial monitoring phase is 22 years.	Still Active
GMF99005	Scion	GM Pine Trees	To field test, in the Bay of Plenty (Rotorua), over a period of 9 years, Pinus radiata and Picea abies plants genetically engineered for herbicide resistance. The total duration of this project is 11 years.	Still Active
GMF03001	Crop and Food Research	GM Onions	To field test onions modified for tolerance to the herbicide glyphosate, and to evaluate their environmental impact; herbicide tolerance; agronomic performance; development as cultivars and equivalency to non-genetically modified onions.	Still Active
GMF06001	Crop and Food Research	GM Vegetable and Forage Brassicas	To assess the agronomic performance, in the Lincoln region, over 10 years of vegetable and forage Brassicas, specifically cabbage, broccoli, cauliflower and kale, modified for resistance (modified to contain genes derived from Bacillus thuringiensis), to caterpillar pests like cabbage white butterfly and diamondback moth.	Still Active
GMR07001	New Zealand Racing Board	GM Equine influenza vaccine	To gain approval to import for release genetically modified vaccines (Proteqflu and Proteqflu Te) to protect horses against Equine Influenza	Application Notified
GMF06002	Crop and Food Research	GM Alliums	To field test over 10 consecutive years, the vegetable alliums species onion, garlic and leek with genetically modified agronomic and quality traits in order to assess their performance in the field and investigate the environmental impacts of these plants	Awaiting Consideration
GMD02028	Ag Research	GM Cattle	To develop transgenic cattle that can express functional therapeutic foreign proteins in their milk and to develop transgenic cattle to study gene function and genetic performance.	Still Active
GMF98002	Crop and Food Research	GM Petunia	To assess the field performance of vegetative plants - Petunia genetically modified for altered plant form or pigmentation.	Completed
GMF98004	Betaseed Inc.	GM Sugar Beet	To evaluate agronomically important characteristics of herbicide tolerant (phosphinothricin resistant) sugar beet (<i>Beta vulgaris vulgaris</i>).	Completed
GMF98011	Carter Holt Harvey	GM Trees	To field test, in Waikato, pre-reproductive Pinus radiata, in order to study factors influencing gene expression and to assess the influence of genetic modifications, involving the insertion of marker genes, on the growth and morphology of trees.	Completed
GMF98007	Crop and Food Research	GM Potatoes	To field test, in Canterbury over 5 years, potato cultivars genetically modified for increased resistance to bacterial soft rots, to evaluate resistance and yield performance of individual lines.	Completed
GMF98008	Crop and Food Research	GM Potatoes	To field test, in Canterbury over 5 years, potato cultivars genetically modified for increased resistance to potato tuber moth, to evaluate resistance and yield performance of individual lines.	Completed
GMF98001	PPL Therapeutics (NZ) Ltd	GM Sheep	GM sheep for purpose of producing a biopharmaceutical (human alpha-1-antitrypsin, hAAT).	Ceased Operation
GMF99004	Ag Research	GM Sheep	GM sheep, with an inactivated myostatin gene, to increase the understanding of myostatin function in order to identify the	Ceased Operation

			effects on sheep muscularity.	
GMF98005	Pioneer NZ Ltd	GM Maize	Import and field test GM maize modified for tolerance to glufosinate-ammonium herbicide, for breeding purposes, in Waikato.	Unused due to Company Closure
GMF98006	Pioneer NZ Ltd	GM Maize	Import and field test GM maize modified to contain Cry1A(b) protein from Bacillus thuringiensis to confer resistance to lepidopteran insects, for breeding purposes, in Waikato.	Unused due to Company Closure

**Appendix III. Miscellaneous Reports Submitted by the
Agricultural Affairs Office in Wellington, New Zealand
during CY 2008**

Previous GAIN Reports		
NZ8001	Bio-Fuel Developments in New Zealand	Feb 25, 2008
NZ8002	HRI Food Service Sector	March 4, 2008
NZ8003	Impact of Drought on New Zealand Milk Production	March 11, 2008
NZ8006	Livestock and Products March 2008 Update	March 27, 2008
NZ8007	New Zealand Announces FTA with China	April 17, 2008
NZ8009	Dairy Semi-Annual	May 16, 2008
NZ 8010	Deciduous Fruit Semi_Annual	May 16, 2008
NZ 8014	Annual Report on Wine Industry	July 3, 2008